Cosmic Chemistry: Planetary Diversity

Plasma Wars

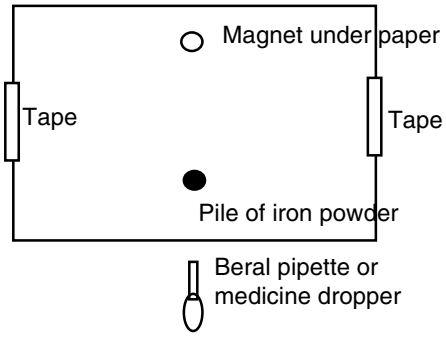
STUDENT ACTIVITY

Instructions:

1. Place a circular magnet underneath a piece of white paper and about 2 cm from the edge of the paper (see illustration below).

2. Tape the edges of the paper to the table top (see illustration below).

3. Place a sample of iron powder in a small pile on top of the paper and about 5 cm from the edge of the paper opposite to the edge where the the magnet is located. (See illustration below.)



4. Use a beral pipette or a medicine dropper to gently blow the iron powder toward the magnet. Sketch your observation after the first puff. Repeat this process until all the powder is distributed from the pile. Make a separate sketch of your observations after each puff. You should have a minimum of six observations and drawings.

5. Obtain a copy of the Student Text "Plasma Wars", from your instructor. After studying the student text, answer the following questions, including reasons for your answers:
   a) Which one of the planets does the magnet most probably model?
   b) What was the iron powder modeling?
   c) What was the pipette (or medicine dropper) modeling?

6. Use the "Plasma Wars" illustrations in the student text and the student handout for references.
   a) Label the parts of your drawings that represent the following:
      1) solar wind
      2) shock wave
      3) stagnation point
      4) magnetosphere
      5) magnetosheath
      6) lines of magnetic field
   b) Give a short description of each labeled part.

7. Various characteristics affect the size, shape, and composition of a planet's magnetosphere. Organize your data into a T Chart with "characteristic" on one side and "size, shape, composition" on the other. Using the text and observations from this activity, write a paragraph that answers the question, "What planetary characteristics appear to influence the size, shape, and composition of the planet's magnetosphere?"